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RESEARCH TRAINING INSTITUTE: PRINCIPLES AND METHODS OF APPLIED RESEARCH FOR JUNIOR COLLEGE RESEARCHERS. FINAL REPORT.

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This report describes a 3-week research training institute supported by USOE funds, which was held at the University of California at Los Angeles, July 1967. It was designed to increase the competence of junior college research directors and staff. The method of recruiting and selecting the trainees is explained. Thirty-eight trainees from 12 states attended all-day sessions offering (1) statistical procedures, (2) research design and methodology, (3) advanced data analysis, (4) guidance in writing up a project for the trainee to do in the 1967-68 year, (5) a review of the junior college collection in ERIC, and (6) time to attend part of the National Conference on the Experimental Junior College. The institute emphasized practicality. Topics selected were those most needed to improve institutional research, especially ones showing the design of experimental models and complex statistical analyses. The trainees evaluated the program on its organization, its interest, the quality of its instructional staff, and its presentation of new approaches to research. The main recommendation was that the next institute be at least four weeks in length. (HH)

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RESEARCH TRAINING INSTITUTE

"PRINCIPLES AND METHODS OF APPLIED RESEARCH FOR JUNIOR COLLEGE RESEARCHERS"

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RESEARCH TRAINING INSTITUTE

"PRINCIPLES AND METHODS OF APPLIED RESEARCH FOR JUNIOR COLLEGE RESEARCHERS"

Project No. 7-0694
Grant No. OEG 4-7-070694-3129

Program Director

Thomas B. Merson, Director of Research
California Junior College Association

July 10-28, 1967

University of California, Los Angeles

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California Junior College Association

Sacramento, California

UNIVERSITY OF CALIF.
LOS ANGELES

AUG 5 1968

CLEARINGHOUSE FOR
JUNIOR COLLEGE
INFORMATION

SECTION I. INTRODUCTION

A. Overview

This report describes a three-week research training institute, supported by USOE funds, conducted at Rieber Hall, University of California, Los Angeles, July 10-28, 1967. The institute was planned, organized, and conducted by the Committee on Research and Development of the California Junior College Association in cooperation with the Extension Division, University of California. The program was designed to increase the research competence of junior college directors of research and other junior college staff who were engaged in institutional research.

Thirty-eight trainees attended. They represented junior colleges from every section of the nation. The pace was intense. Full-day sessions, often with evening meetings provided: (1) a substantial review of statistical procedures, (2) a comprehensive exposure to research methodology and research design, (3) a selected coverage of data analysis emphasizing advanced topics of analysis, (4) guided experience for each trainee in writing a research project which he planned to complete in his college during the ensuing year, and (5) supplementary activities including review of the junior college ERIC collection, and part-time attendance at the National Conference on the Experimental Junior College.

Practicality characterized the focus of effort throughout the institute. The trainees held positions which required them to assume increasing responsibility for institutional research--responsibility for which many needed additional preparation. Instruction in the institute, therefore, was directed as far as possible toward closing the gap between the preparation trainees brought to the institute and the competence they needed to execute their research responsibilities. For example, design topics selected were those commonly needed to improve institutional research. Experimental models were emphasized. Topics in statistics were chosen to illustrate the merits of selecting one form of analysis over another. Trainees were given opportunity to test their ability to apply the institute content by formulating in group sessions desirable design and analysis strategies to real problems--many of them complex. Finally, each trainee developed a full proposal for a problem which he brought to the institute from his college.

Morale in the group was unusually high. Trainees and staff all accepted the intense pace. Their evaluations reflected their sincere appreciation for the opportunity to participate in a practical seminar, and all lamented the probability that other groups in the future might not have this opportunity.

B. Historical Background and Genesis of the Institute

During July, 1966, two similar institutes were conducted concurrently at the University of California, Berkeley and Los Angeles. They were unusually successful. Anticipating the opportunity to continue in 1967, the 1966 trainees provided helpful suggestions for making future institutes even stronger. When USOE staff indicated that 1967 funds were extremely limited, the 1967 proposal reduced the institute from four to three weeks, reduced the enrollment from 50 to 40 trainees, dropped the hands-on experiences in the computer lab, and conducted one institute of 40 trainees in contrast to two concurrent institutes of 50 trainees. All of the above were calculated to operate as efficiently as possible.

A more detailed resume of the genesis of the California Junior College Research Training Institutes is given in the 1966 report. Briefly, the institutes were organized to fill a serious training gap in a greatly underrated segment of higher education--the junior colleges. The nation's junior colleges are growing at a rate unequalled by any other segment of higher education. More than 75 new junior colleges were started last year. These colleges are striving to privide realistic education for those who cannot find this opportunity in other kinds of colleges. These new colleges encounter critical, refractory problems of organization, instruction, curriculum, and guidance, which are largely unknown to colleges which have selective admission practices. These problems can only be solved by incisive, sustained research. But in the junior colleges, there is an inadequate pool of research talent to launch a statewide or nationwide attack on these intricate problems of junior college operation and development. Institutes were judged to be the best means of providing quick, intensive, practical upgrading to a selected corps of junior college research directors and other staff leaders who in turn could return to their respective colleges and lead others in research efforts.

As a result of the 1966 and 1967 research training institutes, nearly 100 junior colleges are now conducting improved research. Less than a decade ago, an office of institutional research was almost unknown in junior colleges. Today, perhaps half of the states have junior collegss with such an office. The publicity given to junior college institutional research through the research training institutes probably contributed significantly to this spreading interest.

C. Trainee Recruitment

Within a few days after receiving USOE approval of the project, on March 15, 1967, announcements and application forms[1] were sent to the presidents of all junior colleges in the western

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[1] See Appendices 1 and 2.

states and to junior colleges with enrollments over 2,000 students in other states. Announcements of the institute were carried by the California Junior College Association's newsletter, CJCA NEWS, and the American Junior College Association's Junior College Journal. Applications were processed, acceptance and rejection letters were sent to applicants, a list of alternates was compiled, and further instructions were sent to accepted trainees.

The institute announcement stated: "To qualify for enrollment, an applicant should: (1) be currently engaged in, or preparing to engage in, some form of junior college research; or (2) be participating in, or preparing to participate in, some innovative junior college program; or (3) be in a position of junior college leadership."

The announcement continued: "Selection of applicants will be based on the following factors: (1) Level of responsibility for research; (2) Potential for exercising leadership in research; (3) Level of interest in research of the applicant and his college; (4) Level, range and recency of formal preparation in research; (5) Extent, kind and recency of research experience."

A high percentage of applicant approval was possible because the application required the college president to endorse the applicant and to verify his research responsibilities. Essentially, the applicant was the nominee of the college president.

D. Trainees[2]

The 38 trainees came from junior colleges in twelve states as follows: California 20, Washington 6, New York 3, and one each from Arizona, Florida, Illinois, Maryland, Michigan, New Mexico, Texas, Utah, and Wisconsin. Forty-eight percent of the trainees were from states other than California.

At the colleges they represented, many of the trainees held more than one position. Selectively, the positions they represented were: College President 3, Director of Research 11, Dean or Assistant Dean of Instruction 7, Counselor or Coordinator of Counseling 5, Instructor-Professor 9, and one each Dean of Admissions, Dean of Men, and Director of the Evening Division.

The range of preparation for research represented by the trainees is difficult to estimate or to summarize. By position, almost one-third served as directors of research in their college. By highest earned degree, 10 had received the doctorate, 26 the

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[2] Roster in Appendix 3.

master's degree, and 2 the bachelor's degree. The number of previous courses in research, statistics, and measurement previously completed was distributed among the group as follows: No previous courses, three trainees; 1-4 courses, 23 trainees; 5-9 courses, 11 trainees; and ten or more previous courses, one trainee. These data do not accurately describe the group, nor do they portray the strengths or research deficiencies of individuals. Recognizing the diversity of background of the group, the staff gave special attention to adapting the instruction accordingly.

SECTION II. DESCRIPTION OF THE PROGRAM

A. Objectives

The goal of the institute was to prepare junior college staff who would increase and expand research-based improvements of educational services in junior-community colleges. Specific objectives of the institute were:

1. To develop a corps of competent junior college researchers who would return to their respective colleges and lead others in research dealing with crucial junior college problems.

2. To familiarize selected junior college researchers with a variety of research designs, techniques, and methods which are applicable to a wide range of applied research problems.

3. To increase the versatility of trainees by confronting them with a variety of research problems representative of the problems they must solve, if they improve the effectiveness of community-junior college education.

4. To increase understanding of research methods and procedures by providing guided experience in their specific application to one or more significant problems of junior college operation.

5. To provide opportunity for research leaders to exchange and pool ideas about promising research approaches to complex and refractory problems which each is facing in his own college.

The focus of effort was on practical applications. This consideration guided the selection of topics, the organization and methodology, and the assignments.

B. Schedule

The daily schedule was adjusted week by week to accommodate differing ratios of lecture discussion, independent study, and reports. Overall, it was sought to achieve an average daily balance of three hours lecture; three hours discussion, reports, and conferences; and three hours independent and group study.

During the first week, in addition to a heavy emphasis on lecture, the group attended some sessions of the National Conference on the Experimental Junior College and became familiar with the operation of the ERIC Center. Independently, they formulated statements of their special problems. The group critiques of these problems solidified the tone of the conference.

The lectures continued throughout the mornings of the second week. Afternoons were scheduled primarily for conferences between staff and individual trainees as the trainees perfected the design and plan of analysis of their individual special projects. Group sessions dealt with discussion of solutions to common junior college problems and special topics.

Lectures continued during the first four days of the third week. Final reports of trainee projects filled three half-days.

C. Curriculum

The major components of the institute program were chosen to reflect specific recommendations of the 1966 institute trainees. The organization sought to make practicality a dominant factor in topic selection, and to provide adaptations which would accommodate the wide range of interest, experience, and previous preparation of the trainees. Brief comments about each of the major program components follow:[3]

1. Research Design. Topics of research design were selected with a view to their applicability to junior college institutional research. More detailed attention was given to design of experimental studies than to predictive or descriptive studies. To basic principles were added description of pitfalls and effective strategies.

2. Elementary Statistics. The traditional topics of elementary statistics were covered selectively under three general headings: Descriptive Statistics, Probability Distributions, and Statistical Decision Theory. For many trainees, this served as an appreciated review of processes once known but forgotten from disuse. For those with minimal previous exposure to statistics, it was elementary enough so they left the institute with a firm grasp of basic statistical tools. During the lectures on elementary statistics, trainees with substantial statistical background met separately to discuss more advanced topics.

3. Data Analysis. The early lectures in data analysis provided a rapid review of elementary statistics. Subsequent discussions also embodied a review of related basic statistics. The principal analysis topics covered were those judged most commonly encountered in junior college research. For each topic, the emphasis was placed on when the process should and should not be used rather than on calculation practice.

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[3] See Appendix 4 for topical outlines of Research Design, Elementary Statistics, and Data Analysis, which collectively comprised the lecture emphasis of the institute.

4. Design-Analysis Laboratory and Student Projects. The design-analysis laboratory was organized primarily for the purpose of providing consultation to individual students as each developed an acceptable research design for the project which they brought to the institute from their respective colleges. Institute staff met with students individually and in small groups by appointment several times during the institute to discuss sequentially: (a) problem statement, (b) design, (c) data collection, (d) analysis, (e) application, and (f) subsequent extension. During the institute the trainees drafted and redrafted their project proposal, perfecting the design by incorporating information learned as the institute progressed.

Near the conclusion of the institute, each trainee prepared a final draft of the research project which he had developed during the institute. These were duplicated, and each trainee received a complete set of project proposals. Insofar as the trainees had brought these projects to the institute from their respective colleges, it is anticipated that most of the projects will be undertaken during 1967-68.

D. Staff

Institute staff were:

Frank C. Pearce, Director of Research, College of San Mateo
Ben K. Gold, Director of Research, Los Angeles City College
H. Stephen Sheldon, Human Factors Scientist, System Development Corporation
Thomas B. Hanson, Director of Research, California Junior College Association

E. Deviations in the Program from the Plan Submitted in the Proposal

In scheduling and content, there was no deviation in the program from the plan presented in the proposal. At the time the proposal was written, one staff position was unfilled. The proposal anticipated this person being selected from one of the eastern states. Dr. Sheldon from California was selected instead. Attendance at the National Conference on the Experimental Junior College was not anticipated when the proposal was written.

SECTION III. EVALUATION OF THE PROGRAM

A. Overview

Information on which to evaluate the institute is available from: (1) the trainee applications, (2) rating forms completed by the trainees at the close of the institute, (3) staff observations and trainee comments, (4) projects produced by the trainees, and (5) performance record of trainees enrolled in the previous institute. Data and generalizations derived from them are summarized below.

1. Trainee Applications. Statements of the trainee applicants and their college presidents submitted on the institute application forms provided an appropriate basis for evaluating the objectives, organization, and instructional content planned for the institutes.

Statements in response to two questions--(1) "Why do you want to participate in this institute?" and (2) "List any specific assistance you want to obtain from the institute "--indicated a critical gap between the level of preparation of the applicant and the research responsibility assigned to the applicant at his college. The letters from the college presidents which supported the applications provided additional vivid expressions regarding the importance and the timeliness of this opportunity for research training. Selected comments from applicants and presidents which illustrate the type of help they sought from the institute and the urgency of obtaining this help were included in the report of the 1966 junior college research training institute. Because the nature of the appeals in the 1967 applications did not differ significantly from those of 1966, specific comments will not be quoted in this report. A generalized summary of the reasons for attending the institute expressed in the 1967 applications might be characterized by "I want to know how to do better what I'n now doing" or "I have been given new responsibilities and need this preparation for the new position." Because a larger proportion of the trainees in the 1967 institute were instructors, more of the applicants indicated a desire to improve teaching effectiveness and sought information about how to measure learning change accurately and meaningfully.

Evidence that the staff interpreted the applications correctly and adapted content, organization, and instruction appropriately is verified by the very high ratings given to these factors by the trainees at the conclusion of the institute.

2. Trainee Rating Forms. Two rating forms were given to trainees at the conclusion of the institute. One form was developed, administered, and summarized by the Extension Division, University of California. Pertinent data from the University questionnaire follows:

Table I. Summary of Evaluations for X331.11
Institutional Research in the Junior College (N = 38)

Heard of Course Through:	
Special Brochure	23
Fellow Teacher	4
Other	9
Poster or Bulletin Board	1
No Response	1
Credit to be Used For:	
Credential	1
Inservice Credit	12
No Response	3
Other (including no credit)	24
Was this Course What you Expected?	
Yes	38
No	0
Organization:	
Well Organized	35
Satisfactorily Organized	3
Presented in an Interesting Manner:	
Outstanding	37
Satisfactory	1
Overall Evaluation:	
Excellent	34
Good	4

The free response section of the University questionnaire produced the following responses to the question "In what ways was the class stimulating and valuable?":

Showed new aspects and emphases of research approach to study	12
Offered the opportunity to exchange experiences with a national group	8
Gave insight into statistical techniques	7
The course was of practical application	12
Quality of instruction and excellent staff	17
Opportunity to attend sessions of the California Junior College Association meetings	1
Individual conferences	1
Renewed participants' enthusiasm	1
No comments	3

The unanimous expression by the trainees that the institute was what they had expected points to the appropriateness of the publicity, especially the Announcement. The ratings given to organization, presentation, and overall evaluation on an independent questionnaire validate the responses collected by the staff. The unusually high ratings attest to the overall effectiveness of the institute.

The responses in the University questionnaire to the question "What have been the problems?" resulted in the following responses:

None	15
Classroom facilities were too small and warm	10
Class size was too large for seminar situation	2
Institute was too brief	8
Assignment of grade without adequate time for evaluation	1
Too much deference to those class members who were talkative	1
No comment	3

Suggestions for the future recorded in the University form were:

Institute should run 4 weeks	1
Should have an air-conditioned room	2
Should be given again	1
Pass grade only should be given to institute members	1
A nationwide junior college research association should be formed	1

Another rating form was developed and administered by the staff with two objectives in mind: (a) to assess trainee reactions to specific elements of planning, facilities, organization, content, instruction, and special activities, and (b) to get trainee recommendations regarding the merits and nature of future institutes. A summary of trainee responses to questions about specific elements of the institute is given in Table 2.

Table 2. Trainee Evaluations of Selected Components of 1967 Junior College Research Training Institutes (N = 38)

Activity	Not Evaluated	Excellent	Satisfactory	Needed Improvement
1. Institute Announcement Procedure	3	19	13	3
2. Living Accommodations				
a. Dormitory	20	9	8	1
b. Nondormitory	27	2	6	3
3. Classroom Accommodations	1	2	15	20
4. Institute Schedule				
a. Daily	1	27	9	1
b. Length (3 weeks)	1	19	12	6
c. Dates (7/10-28)	5	20	12	1
5. Institute Content				
a. Design	0	34	4	0
b. Statistics	0	36	2	0
c. Analysis	0	32	4	2
6. Instruction				
a. Lectures	1	32	5	0
b. Individual Conferences	0	27	11	0
c. Group Discussion	0	22	13	3
d. Trainee Reports	1	16	18	3
e. Separating Groups	9	13	11	5
7. Related Activities				
a. Experimental Junior College Conference	0	25	11	2
b. ERIC	0	22	15	1
c. Library	0	23	14	0
d. Assignments	2	14	17	4

Highlights which can be derived from Table 2 can be generalized by the statement that the trainees gave unusually high ratings to all facets of the program. The only items in which more than 15 percent rated as "needing improvement" were classroom accommodations and institute length. The fact that 84 percent or more of the trainees gave an "excellent" rating to institute content and lectures attests to the effectiveness of the staff. The daily schedule, institute dates, individual conferences, group discussion, the Experimental Junior College Conferences, ERIC, and the library were all rated "excellent" by 20 or more of the 38 trainees. Supplemental comments by the trainees with respect to the items summarized in Table 2 were collected and have been compiled for consideration if another institute is proposed in the future.

3. Staff Observations and Trainee Comments. The staff had made every possible preparation to ensure that instruction would accommodate the needs of trainees. Staff members each had copies of each trainee's application in advance of the institute. The staff met and corresponded several times in advance of the institute to coordinate the part each would play in the team effort and to assure a minimum of overlap in the presentations each would lead. Most important, perhaps, three of the four staff had participated in the previous summer's institute and consequently had profited from this preparation. These comments are prefatory to stating that the staff approached the institute with confidence that they knew what the trainees needed and with assurance that these needs could be met. The staff were apprehensive about the short time span and the extreme range of preparation of the group of trainees. No major adjustments were made in the instructional strategy, although adjustments were made from week to week in time allocations to accommodate special requests of the trainees, such as the request to attend sessions of the National Conference on the Experimental Junior College.

The obvious achievement of the trainees and their substantial improvement as the session progressed was a source of satisfaction to the staff. During the first week, the staff admittedly were somewhat uncertain whether all trainees would get a problem well defined. Comparison of the initial statements of the first week and the statements of their final presentations are tangible evidence of trainee progress. The staff were unanimous in their belief that every trainee applied himself fully during the entire session. Morale was extremely high and increased each week. It was satisfying to the staff to see by the trainee evaluations that there was concurrence "that it would have been difficult to have improved the institute."

The staff's high evaluation of trainee morale, satisfaction, effort, and achievement was best corroborated by trainee comment on the last two questions of the institute evaluation form which asked about (a) aspects of the institute which were most

outstanding, and (b) aspects of the institute which if changed would have increased the value of the institute.

To the first question (outstanding features), the trainees singled out the staff, the organization, and the content for special commendation. Other features mentioned with approbation but less frequently were: consultations, assignments (project development), the opportunity to exchange ideas, the practicality of the program, trainee reports, and auxiliary activities or services, such as the library, ERIC, and the junior college conference. A few quotations may convey the sincerity of the trainees:

> "This entire program was the most exciting, stimulating, and valuable institute I have ever been involved in."
>
> "The competence of the staff and their skill in presenting the material in a way that was interesting (even entertaining), realistic, and practical. I compliment the entire staff. I surely appreciate having had the opportunity to participate."
>
> "The focus on individual projects with help on design, statistics and analysis made the workshop of maximum worth to the individual. . . ."
>
> "My project report is only a preliminary step in a marathon--but now I know how to proceed. . . ."

To the second question (improvements suggested), the recurrent theme was: Given the limitation of three weeks, it was about as well balanced as it could be. The most frequent suggestion was more assignments! Although this suggestion was made in many forms, the general expression was that time was too short for the trainees to feel they had mastered any of the content which the institute covered. Many specific points were suggested by the trainees, such as more complete coverage of design, statistics, analysis, grantsmanship, etc; preparation of problem sets, model designs, analysis options, etc., in advance of the institute; more work on proposal writing, more conference time; and experience with calculators and data processing. Quotations may better portray trainee feelings:

> "I see no way that significantly more could have been accomplished for the overall group."
>
> "Some daily and specific tasks such as the two assignments given would have helped reinforce the daily learning, at least for the two first weeks while we were still floundering around with our own proposals."
>
> "A slightly longer lunch hour . . ."

4. Projects Produced by the Trainees. Each trainee was required to bring to the institute a research project for which he would produce a design during the institute and which he could complete at his college during the ensuing year. A list of the titles of these projects is in Appendix 5 of this report, and a set of trainees' papers has been sent to USOE.

The trainee projects were not in all cases ones which would reflect maximally the instruction of the institutes. For this reason, the staff would have, in some cases, preferred other project titles. The staff recognized, however, that these were projects assigned to the trainee by his college and each represented an important problem at his college. Consequently, the staff concentrated effort on assisting each trainee in developing an appropriate project design. In some cases even this had limitations because some aspects of the project had already been agreed to or started before the trainee enrolled in the institute.

The need of the trainees for instruction in research design was uniformly apparent in their initial effort to draft their project plans. As the institute progressed, subsequent drafts were much improved. The trainees themselves recognized their improved competence by noting, as they orally presented their final reports, many changes they planned as a result of instruction which they had received after the final draft had been written.

5. Performance Record of Trainees Enrolled in the Institute. From the data presented and discussed above, it is clear that a high level of staff and trainee satisfaction with the program of the institute was attained. There is, however, a larger question which should be evaluated: Do the institutes have a lasting impact? The real test of the worth of the institutes will be determined by the degree to which trainees produce improved research in their respective colleges. It will be some time before the extent of such impact can be determined. In this respect, the record of the trainees in the 1966 institutes is more revealing than the shorter record of the 1967 institute trainees. Although a formal follow-up study of the 1966 trainees has not been made, some information about their work has been collected informally.

The process of trainee selection is, in essence, one of institutional recommendation. Each trainee comes to the institute with a problem assigned by his college which he is expected to carry out upon his return. In addition, some trainees come to the institutes because recent promotions have given them research responsibility. Still others are in positions where research direction is already their responsibility but insufficient attention has been given to research in the past. Informal communications with many of the college presidents attest to the improvement of research as a result of the increased skills and knowledge derived by trainees from the institutes. Informal communication with the trainees

confirms the information from the presidents. Many of the trainees have been subsequently given full-time research-related assignments. Others have reported their success in involving substantial numbers of the faculty--attesting to their positions of leadership.

Apart from the increased research activity of individual trainees, there has been an increase in cooperative research among the junior colleges, a movement to which the institute contributed directly. This is perhaps best illustrated by the formation of the Northern California Research Group, a semiformal organization of trainees who are cooperatively developing and conducting inter-institutional research projects. The University of California, Los Angeles, has initiated several similar cooperative projects among junior colleges. Presumably, institute trainees will play key roles in these activities.

The most tangible evidence of the effectiveness of the institutes was demonstrated at the 1967 California Junior College Research Conference. At this session which has as its prime objective the furtherance of research in junior colleges, institute trainees were in charge of workshop sessions to develop models of research design. The insightful leadership which the trainees demonstrated was a thing of beauty.

These illustrations, of course, are all positive. Those who know the facts realize that the substantial gains derived from the institutes are only a small fraction of the total achievements which need to be made. Nevertheless, viewing the larger picture objectively, the impact of the institutes has been both positive and significant.

B. Program Factors

Evaluation of facets of the program sought by the instructions for this report follow:

1. Objectives. Both trainees and staff agreed that the objectives were appropriate and that they were achieved to an unusual degree within the time limits of the institute. The objectives achieved most successfully were: (a) adaption of content to a wide spectrum of trainee needs and background, (b) a broad overview of research methodology, (c) an intensive review of techniques, especially analysis, (d) practice in designing research, and (e) opportunity to become identified with a research group. In addition, a notable achievement was an elevation of the level of aspiration and inspiration of the trainees individually and as a group.

Without discounting the success of the institute to achieve its objectives, it must be recalled that the objectives were selected as a realistic compromise with the ideal. Research training without substantial attention to computers cannot be judged ideal.

An institute organized around a single circumscribed field with focus on the solution of an interrelated cluster of problems would be much more effective and efficient. An institute with built-in plans for follow-through would have more lasting impact. Approval of a proposal embodying these features seemed improbable at the time the proposal was written.

2. Content Focus. The content of the institute received an incredibly high endorsement by the trainees. They approved topic selection on the basis of practicality, yet both staff and trainees recognized the superficial treatment of many topics necessitated by the short time span of the institute.

In spite of the overwhelming evidence of the success of the institute, the Director is of the opinion that the same content could be made more meaningful to trainees by organizing the instruction around three types of research--descriptive, predictive, and experimental--and working through a model problem for each of these. This approach would, of course, require a tremendous amount of advance preparation on the part of the staff, a provision which seemed impossible for the 1967 sessions.

3. Staff. Trainees gave unanimous commendation to the staff. It would be difficult to bring together another group who collectively were more effective. The work load for the staff permitted them no time for other activities--it was a day and night operation. Part of the strength of the staff derives from the fact that they were all excellent teachers. A second strength was their firsthand familiarity with the subject of the institute--junior college research.

4. Trainees. The trainee selection process seemed satisfactory. In this institute, there was an unusually wide spread of preparation and responsibility for which instructional accommodation was planned. Throughout the institute, both trainees and staff discussed the merits of a heterogeneous versus homogeneous group. They also discussed the merits of faculty participation on one hand, and administrative participation on the other. No consensus was reached on these points. The fact is that the colleges profit from an informed orientation to research on the part of both faculty and administration. The unanswered question is which group is more important at this stage?

Trainees were selected from eleven states. This wide geographical representation strengthened the institute and should be continued. The disadvantage of enrolling large numbers from distant colleges is that of transportation expense. Because so many trainees were selected from outside California, enrollment in the institute had to be closed at 38 instead of 40 in order to remain within budget limits.

5. Organization. Trainee commendation of the institute's organization was second only to the competence and effectiveness of the staff. Many trainees would have preferred four weeks to three, but they approved of the selection of dates and the daily schedule. The classroom which was available to us was too small for a group of 38. This resulted from the fact that, by the time the proposal was approved, other institutes had prior selection of the facilities.

The final question in the trainee evaluation form was: "We expect to submit a proposal for another institute next year. What changes in organization, content, or instruction would you recommend including in the proposal?" The replies are perhaps well characterized by one respondent who wrote: "None, just let them know of our support of such programs." Readers should know that the replies to this question at the 1966 institutes elicited comments which, when incorporated into the 1967 plan, seemed to strengthen the 1967 institute. There was no such concentration of recommendations from the 1967 trainees. Among the individual recommendations were: (a) include more instructors among the trainees, (b) schedule an institute for advanced-level researchers, (c) give more direct attention to proposal writing, (d) have trainees prepare a well-developed statement of their problem in advance of the institute, and (e) provide more daily practice on topics (statistics and analysis) covered in the lectures.

Cooperation from the Extension Division of the University was excellent. The availability to the trainees of ERIC, the University library, and attendance at the National Conference on the Experimental College were all appreciated by the staff and the trainees.

Inadequate secretarial help at the institute proved to be a major annoyance. The part-time student secretaries, secured through the University Placement Office, were unfamiliar with working with ditto. The institute plan called for trainees to exchange copies of their proposal plans at several stages of development. The volume of work overwhelmed the girls because of their inexperience in making ditto corrections quickly. The trainees, however, pitched in to assist at the final critical rush. The exchange of papers was essential to the institute, and the trainees all benefited from and appreciated the effort which was made to let them take home this substantial collection of ideas and designs--all dealing with problems important in the junior college, and especially important to this research-oriented group of trainees.

6. Budget. The budget was adequate. Every effort was made to conduct the institute economically. Trainee travel was paid on the cheaper rate, air or automobile. Those who came by air were advised to arrange for vacation rates. All trainees were willing to make these compromises. Trainees collated and stapled their own papers, and some did their own report typing and duplication to

reduce demands on the secretarial staff. The instructional staff was grossly underpaid for their day and night service, but for them it was labor for a worthy cause. Trainee dependency allowances caused considerable extra work. This trainee group had unusually large families, and this factor was underestimated in the budget. The contract did not nearly cover the expenses and time required for preparing the proposal, announcing the institute, screening the applications, filling cancellations, making arrangements with the University, or writing the final report.

C. Major Strengths and Unique Features

Outstanding features of the institutes have been identified and described previously. Consequently, notation at this point will be limited to a succinct listing:

1. Timeliness. Coming at a time when junior colleges are research-ready, when competent researchers are few, and when increased attention to research is imperative, the institute was most timely.

2. Upgrading. The scope of topic coverage which provided an intense review of all of the elementary and most of the advanced topics of research design and data analysis provided a range of interrelated experiences nowhere else available.

3. Practicality. Every effort was made to select experiences which had direct practical application to trainee needs. Favorable response by trainees was directly proportional to the degree to which this goal was attained--it was an overwhelming endorsement.

4. Staff. The competence of the staff won high approbation of trainees.

D. Major Weaknesses and Difficulties

In contrast to the 1966 institutes, the 1967 institute moved along remarkably smoothly and effectively from beginning to end. There were no major weaknesses over which the staff had control. The success was attributable to a staff who were willing to give of themselves far beyond realistic expectations and to trainees who were hungry for an opportunity to improve their research competence. Both groups extended themselves to whatever degree was necessary to overcome obstacles.

E. Overall Evaluation

The satisfaction and appreciation of the trainees was so unstinting and genuine as to diminish the the trials and tribulations of organizing the institute. Those who did not attend the institute

will have difficulty appreciating the richness of the experience for the trainees. Postdoctorate students compared it favorably with their longer, formal preparation. Many acclaimed it to be the best institute they had ever attended.

There are many who hold short-term institutes in low esteem. In the case of the junior colleges, however, because of the press of critical problems which cannot await a three to five-year training program, because of the availability of key junior college research staff only for short periods, because some research training is needed for large numbers, and because of the advantages of bringing together groups with common problems, the institute approach is the preferred approach.

If permission could be obtained to organize similar research training around a group of common problems, and to use the institute as a staging ground for planning a cooperative attack on the problems for which research designs were perfected in the institutes, the program would have no peer. The Director sincerely believes in this way, more effectively and more economically than in any other way, substantial headway could be made toward the solution of the perpetual, refractory, critical problems which face junior colleges as they valiantly try to respond to the plea of society for universal post-high school education.

F. Comments and Recommendations Regarding USOE Administration of the Educational Research Training Program

In the 1966 research training institute report, the fundamental problems of USOE support of research were discussed in some detail. These criticisms seem as valid now as they did a year ago.

This report should underscore the fact that of all the research agencies of USOE the Research Training Branch has been the most understanding of the educational needs of the junior colleges. A note of sincere and warm appreciation is due Dr. Burchinal and Dr. Colby.

Compared to other fields in which the writer has had experience with USOE, arrangements for the 1967 institute were relatively simple and directions were clear. The USOE staff were candid in replying to a preliminary inquiry about the availability of funds for a 1967 institute. They were explicit in guiding us with respect to limitations of program which might be approved. Notification of approval was promptly sent after approval was granted, and payment was received in time to pay the expenses of the trainees.

The problems which persist are those of uncertainty and timing. If the California Junior College Association could be assured of funds to hold similar institutes each summer, a long-term plan could be initiated to build staff and instructional

materials. If an announcement could be made earlier in the year, colleges and key personnel of these colleges could plan in advance for the institutes. Without such assurance, it is doubtful that future institutes could be organized any better than the one just completed.

The nation's junior colleges, the fastest growing segment of higher education, deserve more than incidental attention from USOE. The 1967 Junior College Research Training Institute was probably as effective and worthwhile a training program as any held anywhere in the nation. However, it is impossible to sustain the interest of competent staff, and the support of participating colleges in an effort that is so uncertain. It should not be too difficult for USOE to see that in the junior college they have a sure winner in a race that is as important to society as any being run.

SECTION IV. PROGRAM REPORTS

A. Publicity

Preliminary plans for the institutes were described at the California Junior College Fall and Spring Conferences, at the California Junior College Research Conference, and at other meetings throughout the year. An announcement was carried in the Junior College Journal and in the CJCA News. A copy of the Announcement is included in the Appendix of this report.

B. Application Summary

1. Approximate number of inquiries from prospective trainees (letter or conversation) 90

2. Number of completed applications received 55

3. Number of first-rank applications (applicants who are well-qualified whether or not they were offered admission) 50

4. How many applicants were offered admission 49

C. Trainee Summary

1. Number of trainees initially accepted in program 38

   Number of trainees enrolled at the beginning of program 38

   Number of trainees who completed program 38

2. Categorization of trainees

   a. Number of trainees who principally are elementary or secondary public school teachers 0

   b. Number of trainees who are principally local public school administrators or supervisors 0

   c. Number of trainees from state education groups 0

   d. Number of trainees from colleges or universities, junior colleges, research bureaus, etc.
      Junior colleges 38

D. Program Director's Attendance

1. What was the number of instructional days for the program? 15

2. What was the percent of days the Director was present? 100%

E. Financial Summary

	Budgeted	Contracted	Expended
1. Trainee Support			
a. Stipends	$ 9,000.00	$ 9,000.00	$ 8,520.00
b. Dependency allowance	1,800.00	4,500.00	5,940.00
c. Travel	4,200.00	4,200.00	3,782.44
2. Direct Costs			
a. Personnel	5,550.00	5,550.00	5,550.00
b. Supplies	550.00	550.00	245.00
c. Equipment	--	--	--
d. Travel	1,320.00	1,320.00	1,040.92
e. Other (University registration)	1,100.00	1,100.00	1,100.00
3. Indirect Costs	1,882.00	2,098.00	2,094.27
Total	$25,402.00	$28,318.00	$28,272.63

APPENDIX 1

RESEARCH TRAINING INSTITUTE ANNOUNCEMENT

CJCA

ANNOUNCING

A

JUNIOR COLLEGE
RESEARCH TRAINING INSTITUTE

on

PRINCIPLES AND METHODS OF APPLIED
RESEARCH FOR JUNIOR COLLEGE RESEARCHERS

July 10 - 29, 1967

University of California at Los Angeles

The institute was planned and is sponsored cooperatively by - - -

THE RESEARCH AND DEVELOPMENT COMMITTEE
OF THE CALIFORNIA JUNIOR COLLEGE ASSN.

and

THE EXTENSION DIVISION AND THE JUNIOR
COLLEGE LEADERSHIP PROGRAM OF THE
UNIVERSITY OF CALIFORNIA AT LOS ANGELES

The institutes are supported by a grant (subject to contract negotiations) from the Division of Research Training and Dissemination, United States Office of Education.

OBJECTIVES

To prepare junior college staff who will increase and expand research-based improvements of educational services in junior-community colleges.

Specific objectives include:

1. To develop a corps of competent junior college researchers.
2. To familiarize junior college researchers with a variety of research designs, techniques and methods.
3. To increase the versatility of junior college researchers.
4. To provide experience in designing research projects.
5. To provide opportunity for exchanging and pooling ideas about promising approaches to refractory problems.

TOPIC OUTLINE

Research Methodology. A comprehensive review of research methodology with emphasis on experimental and predictive design.

Statistics. Students may be placed in elementary or advanced statistics (or both) depending on the extent and recency of previous preparation. The elementary course will extend through tests of significance. The advanced course will deal with such topics as correlation, regression, analysis of variance and covariance, and non-parametric statistics. Application of statistical analysis to real research problems will be a major emphasis of both sections.

Design and Analysis Laboratory. Application of research and analysis principles will be the focus of this session. Each trainee will develop fully an approved research plan. Trainees will hold individual conferences with staff.

DAILY SCHEDULE

8:30 - 9:30	Research Methodology
9:45 - 10:45	Advanced Statistics
11:00 - 12:00	Elementary Statistics
1:00 - 4:00	Design and Analysis Laboratory
	1:00 - 2:00 Group Projects
	2:00 - 4:00 Individual Projects

STAFF

Dr. Frank C. Pearce, Director of Research, Modesto Junior College (Research Methodology)

Dr. Benjamin K. Gold, Coordinator, Research and Development, Los Angeles City College (Elementary Statistics)

_____, (Person to be announced) (Advanced Statistics)

Dr. Thomas B. Merson, Director of Research and Development, California Junior College Association (Project Director)

ELIGIBILITY AND SELECTION OF TRAINEES

To qualify for enrollment, an applicant should:

(1) be currently engaged in, or preparing to engage in, some form of junior college research, or
(2) be participating in, or preparing to participate in, some innovative junior college program, or
(3) be in a position of junior college leadership.

Selection of applicants will be based on the following factors:

1. Level of responsibility for research.
2. Potential for exercising leadership in research.
3. Level of interest in research of the applicant and his college.
4. Level, range and recency of formal preparation in research.
5. Extent, kind and recency of research experience.

STIPENDS

There will be no tuition fee. Stipends of $75.00 per week per trainee, $15.00 per week per dependent, and round-trip travel cost will be provided. (These items are conditional upon contract arrangements with U.S.O.E.)

LIVING ACCOMMODATIONS

Space is reserved for housing and meals in a modern University dormitory. Off-campus housing is available

CREDIT

Three units of University Extension credit are available.

APPLICATION PROCEDURE

Applicants must complete an Application Form, obtain a supporting letter from their college president verifying their research responsibilities, and forward these by April 25 to:

Thomas B. Merson, Director of Research
California Junior College Association
Bakersfield College
Bakersfield, California 93305

Effort will be made to notify applicants of their acceptance by May 15. Further information will be provided on request.

APPENDIX 2

RESEARCH TRAINING INSTITUTE APPLICATION

CALIFORNIA JUNIOR COLLEGE ASSOCIATION
Committee on Research and Development

APPLICATION FOR ENROLLMENT

1967 Summer Institute: "Principles and Methods of Applied Research for Junior College Researchers"

Instructions

TO THE PRESIDENT --

Please give an Application Form and an Announcement to persons in your college who might be interested and who might qualify for a research traineeship. Ask those who wish to apply to forward their Application by April 25 to:

Thomas B. Merson
C J C A Director of Research
Bakersfield College
Bakersfield, California 93305

In view of the exceptional success of last year's institutes, we expect to receive an increased number of applications this year. In evaluating applications, we ascribe considerable weight to statements in the president's letter which indicate a commitment of the college to research and which identify a particularly important study in which the trainee will be engaged.

TO THE APPLICANT --

The C J C A Committee on Research and Development believes the institutes described in the attached Announcement will be of significant assistance to anyone who is engaged in junior college institutional research.

Complete the attached application, ask your college president to write a letter verifying your research responsibilities in your college, and send both to Dr. Merson as soon as possible.

We have distributed this Announcement before receiving budget information from U.S.O.E. because we know it is important for applicants to have the Announcement as early as possible. We will inform applicants of any significant errors in this advanced statement.

We have set April 25 as the date to begin processing applications. If you are uncertain about applying, a letter of intent may hold a place for you temporarily. We hope to notify approved applicants by May 15.

CALIFORNIA JUNIOR COLLEGE ASSOCIATION 3/15/67
Committee on Research and Development

APPLICATION FOR ENROLLMENT, CJCA RESEARCH INSTITUTE
University of California, Los Angeles
July 10 - 29, 1967

1. Applicant

Name _____

Title _____

College _____

2. Approval of College President

_____
(signature)

3. Education (List all post-high school education)

Institution	Attendance Dates	Degree	Major	Minor

4. Professional Experience (List most recent position first)

Institution	Dates	Position	Fields

5. Research Training (List any course you have completed in (1) research and research methodology, (2) statistics and probability, and (3) educational measurement)

Course	Approx. Date	Institution

6. Research Responsibility. Describe your present responsibility for institutional research; or your assured future responsibility for research; or your supervisory responsibility; or your participation in innovative programs. (See Announcement for qualifications.) Attach a letter from your college president verifying this responsibility.

7. Research Experience. List titles, approximate dates, where done, and a brief description of any research you have conducted.

8. Special Interest and Competence. Why do you want to participate in this Institute? What special competence will you bring to the Institute?

9. Assistance Sought from the Institute. List specific assistance you want to obtain from the Institute which might prepare you to conduct institutional research more effectively. (Your answer will help us plan institute content and organization.)

10. Special Qualifications of your College. Provide information which describes the interest of your college in institutional research, or the need to elevate its research effort in the future.

11. Choice of Research Project. It is assumed that each trainee will return to his college to conduct, supervise, or participate in some research activity. During the institute, each trainee will develop fully a research project. Trainees are urged to select a problem which will require an experimental or predictive design. Exceptions will be approved for valid reasons. Further instructions on selecting a problem will be sent to approved trainees.

Please state below a tentative study title and reasons for this selection:

APPENDIX 3

ROSTER

1967 JUNIOR COLLEGE RESEARCH TRAINING INSTITUTE

Rieber Hall, U.C.L.A., July 10-28, 1967

California

1. Clark, Robert - Counselor, Director of Research, Reedley College, Reed and Manning Avenues, Reedley, California 93654

2. Conroy, David - Counselor, Research Test Office, Yuba College, Beale Road and Linda Avenue, Marysville, California 95901

3. Duling, John - Assistant Dean, East Los Angeles College, 5357 East Brooklyn Avenue, Los Angeles, California 90022

4. Hansen, Michael - Administrative Assistant, Funding Projects and Institutional Research, College of Marin, Kentfield, California 94904

5. Hess, Jack - Coordinator of Instruction, Los Angeles Pierce College, 6201 Winnetka Avenue, Woodland Hills, California 91364

6. Humiston, Thomas (Fred) - Director of Testing and Research, City College of San Francisco, Ocean and Phelan Avenue, San Francisco, California 94112

7. Hunt, Kenneth - Assistant Dean, East Los Angeles College, 5357 East Brooklyn Avenue, Los Angeles, California 90022

8. Laird, Cecil (Bill) - Instructor, Los Angeles Trade-Technical College, 400 West Washington Boulevard, Los Angeles, California 90015

9. Locks, Charles - Coordinator of Testing and Research Consultant, Los Angeles Valley College, 5800 Fulton Avenue, Van Nuys, California 91401

10. Lude, Carl Juul - Dean of Admissions, Records and Research, College of the Redwoods, 1040 Del Norte Street, Eureka, California 95501

11. Mansfield, Henry - Dean, Division of Mathematics and Engineering, El Camino College, El Camino College, California 90506

12. Metzger, Mrs. Carol - Instructor of English, Los Angeles Pierce College, 6201 Winnetka Avenue, Woodland Hills, California 91364

13. Olavarri, Martin - Registrar, Diablo Valley College, 321 Golf Club Road, Pleasant Hill, California 94523

14. Osner, Henry - Mathematics Instructor, Modesto Junior College, College Avenue, Modesto, California 95350

15. Stubblefield, Jim - Counselor-Instructor, Psychology, Diablo Valley College, 321 Golf Club Road, Pleasant Hill, California 94523

16. Thompson, Fred - Instructor in Economics, Riverside City College, 3650 Fairfax Avenue, Riverside, California 92506

17. Wattron, Frank - Chairman, Humanities Division, Bakersfield College, 1801 Panorama Drive, Bakersfield, California 93305

18. Welsh, Lee - Mathematics Instructor, Cuesta College, P. O. Box J, San Luis Obispo, California 93401

19. Williams, Gilbert - Director, Reading Center, San Bernardino Valley College, 701 South Mt. Vernon Avenue, San Bernardino, California 92403

20. Wortham, Miss Mary - English Teacher, Fullerton Junior College, 321 East Chapman Avenue, Fullerton, California 92634

Other Western States

1. Almvig, Deene - Counselor and Coordinator of Institutional Research, Skagit Valley College, Mount Vernon, Washington 98273

2. Barnett, Thomas - Director of Institutional Research, New Mexico Military Institute, Roswell, New Mexico 88201

3. Blair, Doane - Director of Counseling, Shoreline Community College, 16101 Greenwood Avenue, North, Seattle, Washington 98133

4. Hamilton, Kellis - Director of Institutional Research, Centralia College, P. O. Box 639, Centralia, Washington 98531

5. Heaner, Wallace - Director, Testing and Counseling, Lee College, Baytown, Texas

6. Holm, Floyd - Director, Snow College, Ephraim, Utah

7. Johnson, Mrs. Emma - Instructor, Spokane Community College, E3403 Mission Avenue, Spokane, Washington 99202

8. Maier, John - President, Peninsula College, Port Angeles, Washington 98362

9. Morgan, Don - President, Big Bend Community College, Moses Lake, Washington

10. Olivanti, Richard - Associate Dean of Instruction, Community Services, Cochise College, Douglas, Arizona 85607

Eastern

1. Davidsen, Carlyle - Counselor, Black Hawk College, 1001 Sixteenth Street, Moline, Illinois 61265

2. Gallo, Robert R. - Director of the Evening Division, Auburn Community College, Auburn, New York

3. Hackett, Arthur - Associate Professor, Institutional Development, Westchester Community College, Valhalla, New York 10595

4. Hammond, William - Director of Institutional Research, Baltimore Junior College, 2901 Liberty Heights Avenue, Baltimore, Maryland 21215

5. Moss, Robert - Acting Dean of Men, Palm Beach Junior College, 4200 Congress Avenue, Lake Worth, Florida 33460

6. Redovich, Dennis W. - Special Service Counselor, Milwaukee Junior College, Milwaukee, Wisconsin

7. Robbins, Fred - Dean of Liberal Arts and Science, Flint Community Junior College, 1401 East Court Street, Flint, Michigan 48503

8. Smith, Alfred - Professor of Business Administration, Corning Community College, Corning, New York 14830

APPENDIX 4

LECTURE OUTLINE
1967 JUNIOR COLLEGE RESEARCH TRAINING INSTITUTE

Topics in Research Design — Frank Pearce

I. Levels of Research - including the purpose, use, advantages, and disadvantages of descriptive, predictive, and experimental studies; principles of experimentation and causation.

II. Sources of Invalidity in Research Designs - including each of the internal and external rival hypotheses and interaction effects.

III. Experimental Designs - including pre-experimental designs (such as the one-shot case study, one-group pretest-posttest, and static group comparison); experimental designs (such as pretest posttest, posttest only control group, and Solomon designs); and quasiexperimental designs (such as simple and multiple time series, nonequivalent groups and the recurrent institutional cycle).

IV. Terminology - including purpose and development of hypotheses; operational definitions; assumptions; independent, dependent, and intervening variables; criterion variables; reliability and validity.

V. Sampling - including nonprobability samples (accidental, quota, and purposive); probability samples (simple random, stratified random, cluster, multistage, and patched-up samples); randomization (purposes and methods); and matching (precision control and frequency distribution control).

VI. Principles of Schedule Construction - including items, construction, criteria, application, advantages, and disadvantages.

VII. Interviewing Principles - including structured, unstructured, procedure, methodology, and criteria.

VIII. Scaling - including rating (graphic, itemized, and comparative), attitude (summated, equal interval, and cumulative), construction, use, and characteristics.

LECTURE OUTLINE

1967 JUNIOR COLLEGE RESEARCH TRAINING INSTITUTE

Topics in Elementary Statistics — Ben K. Gold

First Week: Descriptive Statistics

I. Introduction and overview - definitions of statistics; probability vs. statistics; types of problems.

II. Data gathering - kinds of data; discrete vs. continuous; qualitative vs. quantitative; ungrouped vs. grouped; frequency distributions.

III. Measures of Central Tendency.

IV. Measures of Dispersion.

V. Calculation of $\bar{x}$ and s_x; grouped and ungrouped data; coded data.

Second Week: Probability Distributions

VI. Probability - concepts and elementary laws; probability distribution function.

VII. Binomial distribution - other discrete distributions.

VIII. Normal distributions - other continuous distributions.

IX. Sampling concepts - random sampling.

X. Sampling distribution for $\bar{x}$; normal populations; central limit theorem.

Third Week: Statistical Decision Theory

XI. Estimation - point and interval estimation; required sample sizes.

XII. Testing Hypotheses - types of errors, critical regions, operating characteristics; one-sided and two-sided tests.

XIII. Tests for means and fractions - large samples, small samples: assumptions.

XIV. Tests for differences - means, fractions.

XV. Nonparametric tests - chi-square test; other tests.

Text: Hoel, Paul G., Elementary Statistics, John Wiley & Sons, 1966. Chapters 1-7.

LECTURE OUTLINE
1967 JUNIOR COLLEGE RESEARCH TRAINING INSTITUTE

Topics in Data Analysis

I. Elementary Statistics Review

- A. Central tendency
- B. Variability

II. Scaling Procedures

- A. Standard scores
- B. Nominal, ordinal, equal-interval, ratio
- C. Logical scaling
- D. Missing data and Winsorization

III. Correlation and Regression

- A. Product-Moment correlation
- B. Multiple correlation
- C. Regression equations
- D. Accounting for variances of the dependent variable
- E. Rho, biserial, point-biserial, Phi, Tetracoric

IV. Criterion Development

- A. Weighting and combining scores
- B. Factor analysis

V. The Null-Hypothesis Concerning Means and Differences Between Means

- A. T-test between independent means
- B. T-test between correlated means
- C. Simple analysis of variance
- D. Two-way - Three-way analysis of variance
- E. Analysis of covariance

VI. Nonparametric Tests

- A. Sign test
- B. Runs test
- C. Matched-pairs signed-rank test
- D. Median test

APPENDIX 5

RESEARCH PROPOSALS PREPARED BY TRAINEES
CALIFORNIA JUNIOR COLLEGE ASSOCIATION RESEARCH TRAINING INSTITUTE
UNIVERSITY OF CALIFORNIA, LOS ANGELES
JULY, 1967

Almvig, Deene	"The Effects of a Summer Intensive Treatment Project for Economically Disadvantaged Youth on Later Educational Achievement, Productivity, Societal Fit, and Self-Percepts"
Barnett, Thomas M.	"A Follow-up Study of New Mexico Military Institute Graduates Class of 1965"
Blair, Doane F.	"Evaluation of a Program for Marginal Students: The College Exploratory Program"
Clark, Robert M.	"Effectiveness of Special Counseling on a Group Basis"
Conroy, David	"The Effectiveness of Alternate Methods of Utilization of the Video Tape Recorder in Instructor Self Critique of English and Social Science Lectures"
Davidsen, Carlyle D.	"A Comparison Between American College Test Scores and Differential Aptitude Test Scores in Predicting Freshman Grade Point Averages in the Engineering Related Technology Curriculum at Black Hawk College"
Duling, John	"A Follow-up Study of 391 Graduates of East Los Angeles College Class of June, 1967"
Gallo, Robert R.	"Student Profile: Auburn Community College Evening Division"
Hackett, Arthur J.	"Identifying and Validating Predictive Equations for Admissions"

Hamilton, Kellis A.	"An Occupational Survey of Selected Areas and Functions in Public Employment"
Hammond, H. William	"Early Prediction of Failure"
Hansen, Michael	"Improvement of Achievement by Engineering Students in Autotutor 'Computers' Course as a Result of Reading Skills Instruction"
Heaner, W. E.	"The Effectiveness of an Occupational Guidance Program Using Video Tape Media in Reducing High School Dropouts and Encouraging College Enrollment of High School Students"
Hess, Jack D.	"Comparison of Integrated and Conventional Methods of Teaching Culturally Disadvantaged Students"
Holm, Floyd S.	"A Comparison of Three Remedial English Approaches at Snow College"
Humiston, Fred	"Selecting Students for Engineering and Technology Courses on the Basis of Psychometric Data"
Hunt, Kenneth L.	"Dinner-Time Classes"
Johnson, Emma	"An Examination of a Self-Learning Center as a Procedure for Upgrading Mathematical Competency for a Data Processing Program"
Laird, Bill	"Predicting the Future of Applicants for Drafting Technology"
Locks, Charles S.	"The Effectiveness of Programmed Learning as an Aid in Increasing the Probability of Success and Improving Student Performance Among Entering Freshmen in Selected Courses"
Lude, Carl J.	"Forecast in Junior College Enrollment by Types of Students"
Maier, E. John	"A Study to Determine What Vocational-Technical Programs Shall Be Inaugurated at Peninsula College During the Next Six Years"

Mansfield, Henry, Jr.	"The Application of the Method of Least Squares and Some Other Techniques to the Analysis of Factors Relating to the Instructional Process"
Metzger, Mrs. Carol	"Remedial English"
Morgan, Don A.	"The Prediction of Success in Aviation Technology at Big Bend College"
Moss, Robert C.	"A Method of Selecting Nursing Students"
Olavarri, Martin C.	"The 'College Within A College' Concept in a California Junior College"
Olivanti, Richard A.	"The Effectiveness of Programmed Learning in a First-Semester Introduction to Economics Course"
Osner, Henry J.	"A Remedial Arithmetic Course as Preparation for Quantitative Courses"
Redovich, Dennis	"Transfer to Junior College Students into Vocational and Technical Programs"
Robbins, Fred	"Developing a Staffing Need Prediction Model"
Smith, Alfred J., Jr.	"A Comparison of the Effectiveness of Teaching Microeconomics by Programmed Instruction and Lecture-Textbook Methods"
Stubblefield, Jim	"An Evaluation of a Career Exploration Class in Education"
Thompson, Fred A.	"An Experimental Design to Evaluate the Effectiveness of Computer Simulation Techniques as a Method of Improving Elementary Economics Education in the Junior Colleges"
Wattron, Frank	"Changing Perceptions of the Duties of Department Chairmen at Bakersfield College"

Welch, Lee	"Predicting Junior College Freshman Mathematics Grade Point Averages from Those Received in High School Mathematics"
Williams, Gil	"Reading Instruction and Its Effect on English and Political Science"
Wortham, Mary	"Effects of Early Identification to Instructors of High-Ability, Low-Achievement Freshman College Students"